Environmental Assessment for Rehabilitation of Acequia de Las Joyas Santa Fe County, New Mexico

FINAL

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Acronyms

BMP	Best Management Practice
CAA	Clean Air Act
CDP	Census Designated Place
CFR	Code of Federal Regulations
CO	carbon monoxide
Corps	Albuquerque District of the Corps of Engineers
CWA	Clean Water Act
dB	decibels
° F	degrees Fahrenheit
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act
FHWA	Federal Highway Administration
ITA	Indian Trust Assets
Leq	equivalent sound level
$\mu g/m^3$	micrograms per cubic meter
NEPA	National Environmental Policy Act
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OSE	Office of the State Engineer
P	Pueblo (archaeological phase)
$PM_{2.5}$	particulate matter that measures 2.5 microns or less in diameter
PM_{10}	particulate matter that measures 10 microns or less in diameter
ppm	parts per million
SR	State Route
U.S.	United States
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WRDA	Water Resources Development Act

FINDING OF NO SIGNIFICANT IMPACT

1.0 NAME OF ACTION

Rehabilitation of the Acequia de Las Joyas.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The Water Resources Development Act of 1986 (P.L. 99-662) authorized the restoration and rehabilitation of irrigation ditch systems and acequias in New Mexico. Due to the importance of acequias to the preservation of cultural and historic values in the state, the U.S. Army Corps of Engineers is providing assistance to the Acequia de Las Joyas for the rehabilitation of the existing sheet pile weir and sluices. An Environmental Assessment (EA), required to evaluate the impacts of modifying the acequia, will be prepared for the following project.

2.1 Proposed Action Alternative

Acequia de Las Joyas is located in Santa Fe County, New Mexico, southeast of Española near State Route (SR) 503 and Pojoaque Pueblo. Water flows into the Acequia de Las Joyas through a sluice at the end of a weir in Pojoaque Creek, approximately 1.5 miles east of U.S. Highway 84/285.

The existing sheet pile weir was constructed in 1971. The existing weir across Pojoaque Creek is leaning downstream due to scouring of the riverbed. In addition, the sluice floors have been eroded by sand and gravel. Under the Proposed Action, rehabilitation of the weir would consist of anchoring with buried concrete and stabilizing the downstream end with a gabion apron and rock riprap. The existing sluice floors and tap would be restored and armored with steel plates.

2.2 No Action Alternative

Under this alternative, rehabilitation of the weir would not occur. Potential failure of the sheet pile weir and its associated structures would be likely to occur if not stabilized, resulting in a lack of irrigation watering the acequia.

3.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

As required by the National Environmental Policy Act, this EA evaluates the potential environmental impacts associated with the proposed weir and sluice rehabilitation. The findings for each resource area are described below.

Geology, Soils. Geology and soils would not be significantly affected under the Proposed Action alternative. Temporary surface disturbance would result from earthmoving to install the concrete anchors and gabion apron, as well as from construction and use of the staging area but soil erosion would be minimized through the use of Best Management Practices (BMP) during construction. Non-riverbed soils would be stabilized with native vegetation after construction is completed. There are prime farmland soils in the land served by the acequia but no impacts to these soils would result from implementation of either alternative.

Water Resources. There would be no negative impacts from implementation of the Proposed Action. The acequia receives water from Pojoaque Creek, and returns it to the creek approximately 3 miles downstream. Construction would occur during a low flow period in the river. This timing and the installation of BMPs during construction would minimize the potential for impacts to water resources.

Section 404 of the Clean Water Act provides for the protection of waters and wetlands of the United States (U.S.) from impacts associated with discharges of dredged or fill material into waters of the U.S. Certain discharges associated with the construction and maintenance of irrigation ditches are exempt from Section 404 permit requirements (33 Code of Federal Regulations [CFR] 323.4[a], Exemption No. 3). Therefore, no Section 404 permit is required for the planned action.

Wetlands and Floodplains. There are no wetlands or 100-year floodplains along the acequia, so none would be affected by implementation of the Proposed Action.

Land Use. Acequia de Las Joyas serves 78 landowners and is used to irrigate 168 acres of pastures, alfalfa fields, small vegetable gardens, orchards and vineyards. The construction would be confined to the existing sheet pile weir and sluices, and would not negatively affect the land along the acequia. No negative impacts to land use would result from the Proposed Action.

Air Quality. Santa Fe County is monitored for particulate matter and carbon monoxide, but it is in attainment for these pollutants as measured by the U.S. Environmental Protection Agency. While there would be the potential for minor temporary increases in emissions and dust during construction, these increases would not result in non-attainment of air quality standards. There would be no significant impacts to air quality under the Proposed Action.

Biological Resources. There would be no significant impact to vegetation, wildlife, and aquatic communities because there would be little change to the area as a result of the Proposed Action. Native vegetation would be reseeded in areas such as the staging area once construction is completed.

Threatened and Endangered Species. No impacts to federal- or state-listed threatened and endangered species would result from the Proposed Action because none are found within the area in and immediately surrounding the acequia.

Cultural Resources. No prehistoric or historic archaeological sites are known to occur within or immediately adjacent to this acequia. Acequia de Las Joyas is eligible for inclusion on the National Register of Historic Places under Criteria a and d of 36 CFR 60.4. This acequia has been subject to years of annual maintenance including modifications such as lining most of the ditch with concrete. The proposed rehabilitation of the weir for the Acequia de Las Joyas would have no adverse effect on the acequia's eligibility as a historic property.

Indian Trust Assets. The construction or implementation of the proposed project is not anticipated to affect any Indian Trust Assets.

Aesthetics. No adverse effect on aesthetics would result from implementation of the Proposed Action. Exposed soil in some areas would be reseeded with native vegetation and could improve the appearance of the area.

Noise. No significant effects on noise levels would result from the Proposed Action. Noise would increase for the short time that construction equipment is working, but no long-term noise increases would occur.

Socioeconomics. There are the potential positive impacts on the productivity of the irrigated land if water delivery is improved, but these impacts would be slight. The irrigated land is used to grow produce and to feed livestock that could supplement landowners' incomes or ability to trade products, but the impact would be negligible and would be difficult to measure. There would be no negative impacts resulting from the Proposed Action.

Environmental Justice. The area surrounding the Acequia de Las Joyas has a relatively high percentage of minorities and low-income families who could benefit from the Proposed Action. The Proposed Action alternative would not adversely affect the health or environment of minority or low-income populations.

4.0 CONCLUSION

The planned action has been fully coordinated with the federal and state agencies with jurisdiction over the biological and cultural resources of the project area. As a result of the EA and the coordination with these agencies, I have determined that the planned action to rehabilitate the Acequia de Las Joyas will have no significant impact on the human environment. Therefore, an Environmental Impact Statement will not need to be prepared for this project.

Dana R. Hurst
Lieutenant Colonel, US Army
District Engineer

11 Feb 2003
Date

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1.0 INTRODUCTION

1.1 BACKGROUND

The Acequia de Las Joyas is located in Santa Fe County, New Mexico, southeast of Española, near State Route (SR) 503 and the Pueblo of Pojoaque **(Figure 1-1)**. The weir of Acequia de Las Joyas is across Pojoaque Creek, approximately 1.5 miles upstream from U.S. Highway 84/285 **(Figure 1-2)**. The acequia is fed by a spring and water diverted from Pojoaque Creek. It is mostly concrete-lined, and includes a sheet pile diversion structure, a weir sluice, and a ditch sluice (NRCS 2000). The system, as a whole, provides water to 78 irrigators on approximately 168 acres of cultivated land. The farms, averaging 2.5 acres, include alfalfa fields, livestock pastures, small vegetable gardens, orchards, and one vineyard (Romero 2002).

Under consideration in this Environmental Assessment (EA) are the sheet pile weir and sluice, as well as the ditch sluice located approximately 100 feet downstream from the ditch headworks of the Acequia de Las Joyas.

The U.S. Army Corps of Engineers, Albuquerque District (Corps), at the request of the Acequia de Las Joyas and the New Mexico Office of the State Engineer (OSE), is planning the stabilization of the Acequia de Las Joyas weir and sluices under the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662). WRDA authorized the Corps to conduct the restoration and rehabilitation of irrigation ditch systems and acequias in New Mexico. Under Section 1113 of the Act, Congress has found that New Mexico's acequias date from the eighteenth century and, due to their significance in the settlement and development of the western United States (U.S.), should be restored and preserved for their cultural and historic value to the region. The Secretary of the Army has been authorized and directed to undertake, without regard to economic analysis, such measures as are necessary to protect and restore New Mexico's acequias. The proposed improvements to this acequia satisfy the intent and purpose of this legislation. The non-federal financial responsibility of any work carried out under this section of WRDA is 25 percent.

The Corps is providing funding and is therefore the action agency for this project. Project design and inspection is the responsibility of the U.S. Department of Agriculture-Natural Resources Conservation Service (NRCS). The State of New Mexico, through the OSE, is the project sponsor. The Corps has the authority for review and approval of the environmental impacts of the proposed project, as presented in this EA. Under the process for these acequia rehabilitation projects, developed between the Corps, the State of New Mexico, and the NRCS under Section 215 of the Flood Control Act of 1968 (P.L. 90-483), as amended, Acequia de Las Joyas would select a contractor and administer the construction contract. NRCS staff would inspect the project during construction to ensure compliance with all plans and specifications, including those written for environmental protection. The NRCS would also be responsible for certifying completion of the project, according to those plans, and specifications before funding would be provided. Upon successful completion of the project, funds would be made available by the Corps to the OSE to pay for rehabilitation of the weir and sluices.

1.2 PURPOSE AND NEED

The existing sheet pile weir was constructed in 1971. The existing weir across Pojoaque Creek is leaning downstream due to scouring of the riverbed. The entire structure is being severely undercut by the combination of scouring and failure of the tieback system. In addition, the floors of both the weir sluice and the ditch sluice (located approximately 100 feet downstream from the ditch head works in the acequia) have been eroded by sediments.

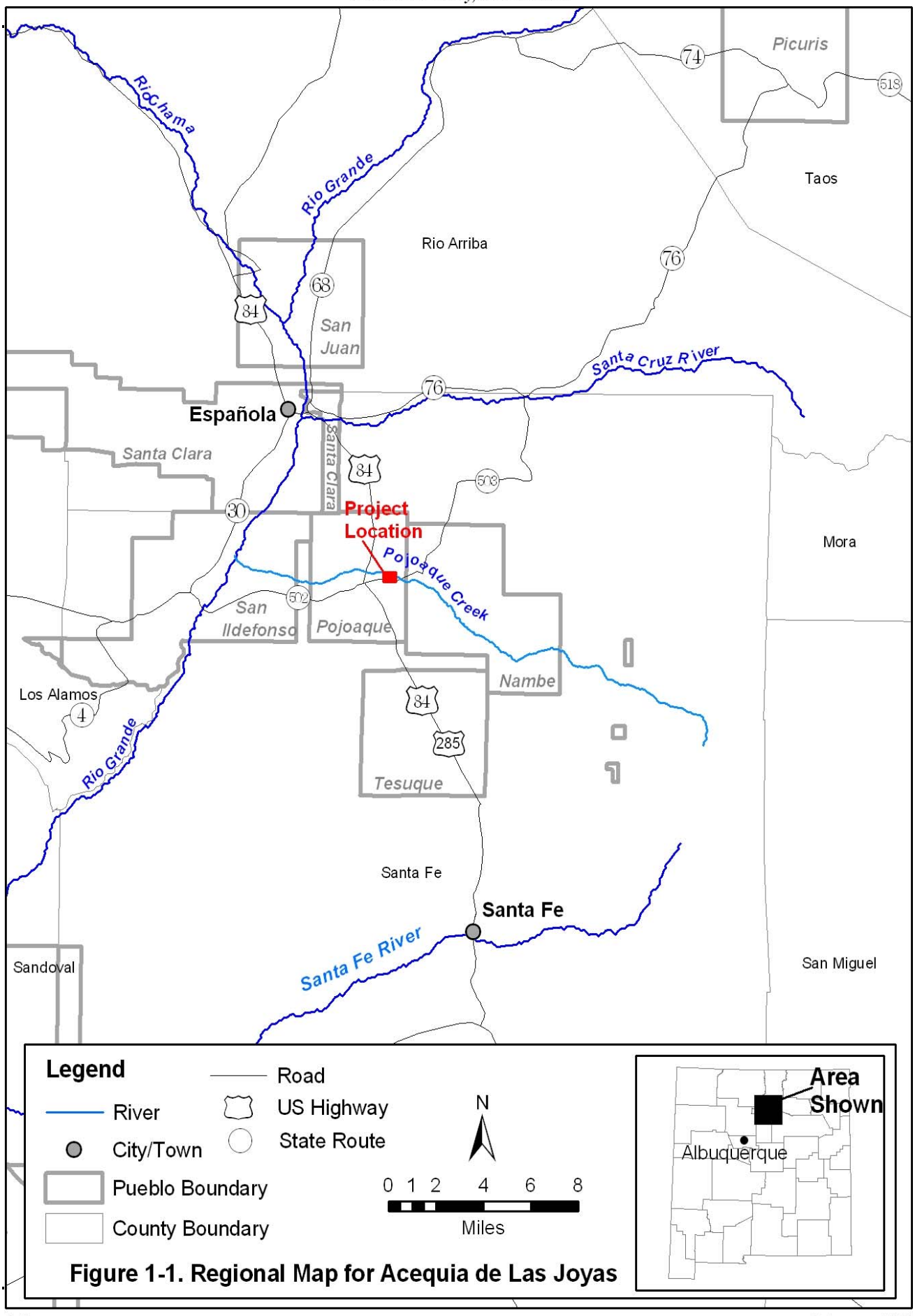

Figure 1-1. Regional Map for Acequia de Las Joyas

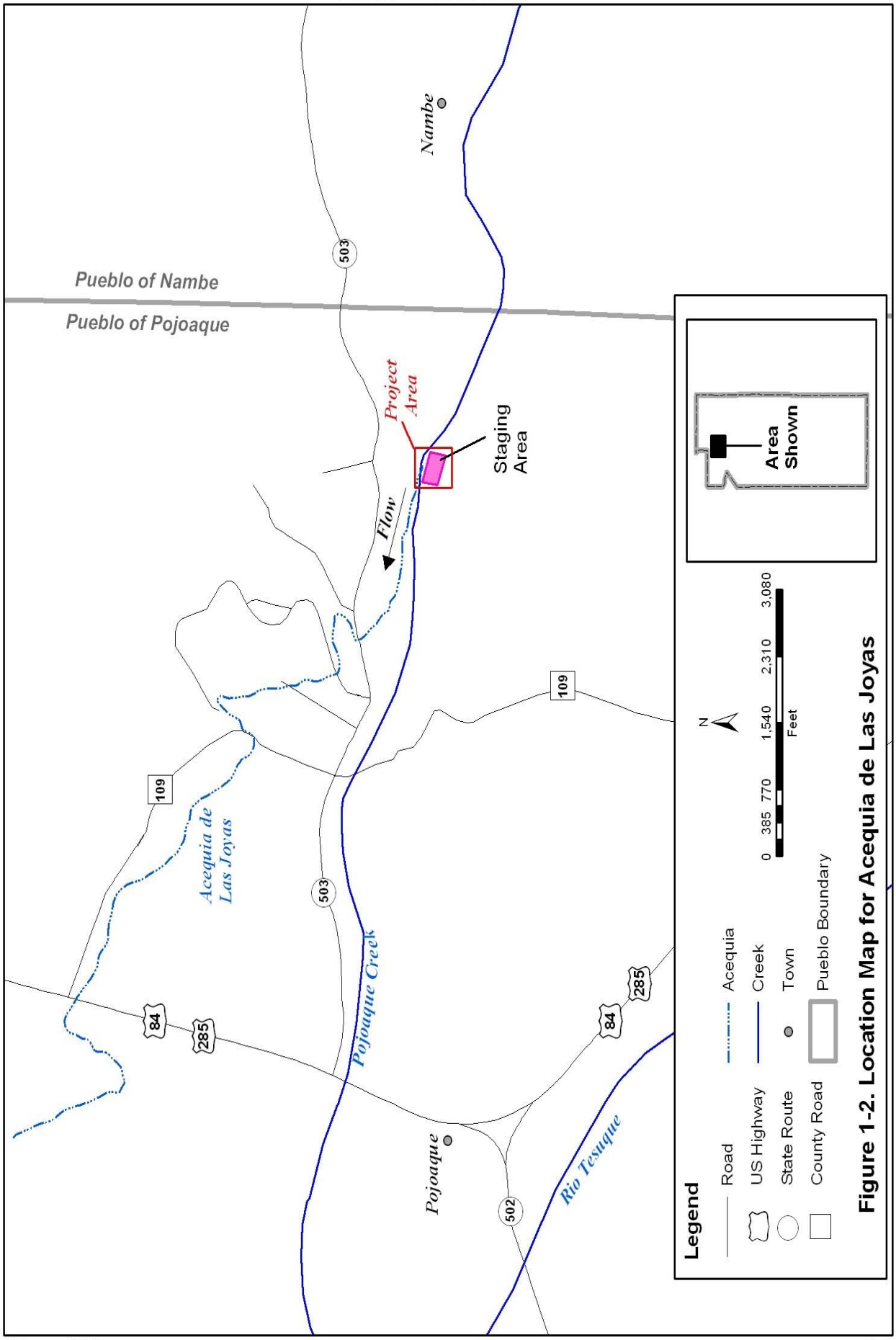

Figure 1-2. Location Map for Acequia de Las Joyas

In order to prevent total failure of the existing sheet pile weir, rehabilitation under the Proposed Action would involve reinforcing the sheet pile weir with a buried concrete anchor system. Erosion on the downstream end would be stabilized by a concrete-capped gabion apron at the base of the weir and loose rock riprap immediately downstream of the new gabion end sill. The existing weir sluice floors would both be restored and armored with ¼-inch steel plates.

1.3 REGULATORY COMPLIANCE

This EA was prepared for the Corps, in compliance with all applicable federal statutes, regulations, and Executive Orders (EO) including, but not limited to the following:

- National Environmental Policy Act (NEPA) of 1969, as amended [42 United States Code (USC) 4321 *et seq.*]
- Regulations for Implementing the Procedural Provisions of NEPA [40 Code of Federal Regulations (CFR) 1500–1508]
- Clean Air Act [(CAA) (42 USC 7401-7671, as amended)]
- Clean Water Act (CWA) of 1977 (33 USC 1251 *et seq.*)
- Endangered Species Act (ESA) of 1973 (16 USC 1531-1544, as amended)
- Fish and Wildlife Coordination Act (16 USC 661 *et seq.*)
- Farmland Protection Policy Act (7 USC 4201)
- National Historic Preservation Act of 1966 (16 USC 470)
- Native American Graves Protection and Repatriation Act (25 USC 3001-3013)
- American Indian Religious Freedom Act of 1978 (42 USC 1996)
- Archaeological Resources Protection Act of 1979 (16 USC 470)
- Protection of Historic and Cultural Properties (36 CFR 800 *et seq.*)
- EO 11514, Protection and Enhancement of Environment Quality
- EO 11988, Floodplain Management
- EO 11990, Protection of Wetlands
- EO 12898, Environmental Justice
- EO 13007, Indian Sacred Sites
- EO 13084, Consultation and Coordination with Indian Tribal Governments
- EO 11593, Protection and Enhancement of the Cultural Environment

This EA is also in compliance with applicable State of New Mexico regulations and standards.

2.0 DESCRIPTION OF ALTERNATIVES AND PROPOSED ACTION

2.1 ALTERNATIVES

Two alternatives were considered to address the problems of the failing weir and eroding sluices for the Acequia de Las Joyas.

1. No Action Alternative: No rehabilitation work would be performed to address the existing problems.
2. Proposed Action Alternative: Stabilize the existing sheet pile weir with concrete anchors and concrete-capped gabion aprons, and restore and armor the existing sluice floors.

2.1.1 No Action Alternative

Under this alternative, rehabilitation of the acequia would not occur. Complete failure of the sheet pile weir is anticipated. The associated sluices would continue to erode as a result of sand, gravel, and water weathering. Failure of the weir would eliminate the primary water supply to the acequia.

2.1.2 Proposed Action Alternative

The Proposed Action would involve reinforcing the sheet pile weir using a buried concrete anchor system with tiebacks upstream from the existing sheet piling. Five standard concrete anchors would be buried 4 feet below the weir crest. Three ¾-inch galvanized steel cables would tie each anchor to the existing steel sheeting comprising the weir. The concrete bumpers currently supporting the weir on the downstream side would be used, and any extra concrete would be removed from the creek and disposed of at a pre-approved waste site.

The existing concrete floors and existing walls of the two sluiceways would be protected by ¼-inch thick steel plating. Prior to application of steel plating to the existing concrete sluiceway floors and walls, the concrete would be cleaned of all debris, sand and soil material. A ⅛-inch thick layer of waterproofing would be applied to the concrete surfaces immediately prior to the final placement of the steel plating (NRCS 2000).

Erosion on the downstream side of the weir would be stabilized by a new concrete-capped gabion apron. Loose rock riprap would be installed immediately downstream from the new gabion end sill for further stabilization (NRCS 2000).

A 1-acre staging area located on Pojoaque Pueblo land along the south edge of the river would use an access road from SR 503 through the Pueblo. The site is nearly clear of vegetation. The Pueblo has agreed to grant a 1-year construction permit to use the staging area (Romero 2002).

2.2 ENVIRONMENTAL PROTECTION

Rehabilitation of the irrigation system would utilize appropriate Best Management Practices (BMPs), installed during and after construction to minimize soil erosion and sedimentation in waterways. Construction would occur during the non-irrigation season, so no water would be flowing in the ditch. Appropriate BMPs to be installed during construction include mulch, straw/hay bales and/or silt fence, and proper grading of slopes, limiting riverbed traffic to rubber-tired equipment and/or metal-matting, and a temporary river channel diversion away from the immediate construction area. Damage to existing vegetation would be avoided as much as possible. Access to the project and staging areas would be from the north side of the creek from SR 503, and would run downstream along the creek approximately 300 feet to the weir. NRCS staff would coordinate with the Corps to approve needed access routes, borrow sites, staging areas, other high use areas, or any changes to these areas, regardless of their ownership or distance, to ensure that natural and cultural resources would be protected. The Acequia de Las Joyas would be responsible for assuring operation and maintenance of the project after completion.

None of the construction would occur within a delineated 100-year floodplain. All waste material would be disposed of properly at pre-approved or commercial disposal areas or landfills. Fuel, oil, hydraulic fluids, and other similar substances would be appropriately stored away from the ditch and creek, and must have a secondary containment system to prevent spills if the primary storage container leaks.

Prior to construction, all environmental protection measures as expressed by contract clauses, design drawings, or other means would be reviewed with the acequia members and the contractor at a pre-construction conference.

To protect soils from wind and water erosion after completion of earthmoving, disturbed areas would be seeded to native vegetation that is appropriate for the soils and site conditions. The recommended NRCS seed mixture is Indian ricegrass (25 percent), galleta (25 percent), western wheatgrass (25 percent), and blue grama (25 percent), to be broadcast at a rate of 13.5 pounds per acre. Establishment of native grasses would also minimize the spread of weeds in the disturbed soil (NRCS 2002).

There are no other actions for the Acequia de Las Joyas known to be planned by other federal, state, county, or municipal agencies.

3.0 EXISTING ENVIRONMENT AND FORESEEABLE EFFECTS OF THE PROPOSED ACTION

3.1 CLIMATE

Average maximum temperature for the project area is 69 degrees Fahrenheit (° F) and the average minimum temperature is 35° F (WRCC 2002). Average annual precipitation in this region is 10 inches, occurring in both rain and snow (WRCC 2002). The majority of the rainfall is received from May through October and the majority of the snowfall is received from December through February. Moist air generated from the Gulf of Mexico acts as the source of rainfall in the summer months, while the Pacific Ocean affects climatic patterns for the winter months through El Niño/Southern Oscillations (Sammis 2001). The average growing season in the project area is approximately 151 days, from late April to late November (NRCS 1998).

3.2 PHYSIOGRAPHY, GEOLOGY, AND SOILS

This project is located in the Northern Rio Grande Basin Section of the Southern Rocky Mountain Province, which is typified by valleys, lowlands, and elevated plains and hills (USFS 2000). In this province, the deep structural basins of the Rio Grande Rift valley separate the high ranges of the Rocky Mountain System. Local landforms include the Pojoaque River valley and the Jemez Mountains. Average elevations in this Rio Grande Basin Section range from 6,875 to 8,800 feet, with the elevation of the Acequia de Las Joyas ranging between 5,880 and 5,900 feet. Cenozoic sedimentary rocks characterize the surficial geology, along with some Tertiary rocks and terrestrial basin fill of the late Tertiary and Quaternary age.

The soil map unit located at the proposed staging area is Bluewing loamy fine sand. Some relevant characteristics of the soil map units at the staging area and in the cropland that is irrigated by the acequia are shown in **Table 3-1**. No hydric soils occur in the project area.

El Rancho is the primary soil series in the cropland irrigated from the Acequia de Las Joyas. El Rancho soils are deep and well drained. Four soil map units are considered prime farmland if irrigated: El Rancho sandy clay loam, 0 to 1 percent slopes; El Rancho sandy clay loam, 1 to 3 percent slopes; El Rancho sandy clay loam, 3 to 5 percent slopes; and El Rancho sandy clay loam, sandy subsoil Variant.

The contractor would use BMPs to minimize erosion during construction, as described in Section 2.2. There would be no significant impacts to soils from the implementation of the Proposed Action.

Under the No Action alternative, maintenance problems associated with the existing weir and sluices would continue. There would be no significant impacts to soils from the No Action alternative.

3.3 WATER RESOURCES

The project site is located in the Pojoaque valley, within the upper Rio Grande basin. Water in the acequia system is taken directly from Pojoaque Creek and returned back into the creek, approximately 3 miles downstream through an arroyo. Designated uses of Pojoaque Creek include cold and warm water fish culture, irrigation, and livestock watering. These uses are not fully supported due to problems with turbidity and stream bottom deposits. These problems are attributed to irrigated crop production, dam construction and repair, and flow regulation (NMED 2000).

Section 402(p) of the CWA specifies that stormwater discharge associated with construction activities disturbing 5 or more total acres of land (1 acre after March 10, 2003) must be authorized by a National Pollutant Discharge Elimination System (NPDES) Permit. NPDES permit authorization is not required in this instance, since less than 5 acres would be disturbed. However, BMPs would be used as necessary to prevent erosion and sedimentation wherever project construction activities occur.

Table 3-1. Soils of Acequia de Las Joyas and Irrigated Cropland

Soil Map Unit	*Permeability*	*Prime Farmland*	*Water Erosion Hazard*	*Wind Erosion Hazard*
Bluewing loamy fine sand	Rapid	No	Low	High
El Rancho sandy clay loam, 0 to 1 percent slopes	Moderate	Yes, if irrigated	Moderate	Moderate
El Rancho sandy clay loam, 1 to 3 percent slopes	Moderate	Yes, if irrigated	Severe	Moderate
El Rancho sandy clay loam, 3 to 5 percent slopes	Moderate	Yes, if irrigated	Moderate	Moderate
El Rancho sandy clay loam, sandy subsoil variant	Moderate	Yes, if irrigated	Low	Moderate

Source: SCS 1975.

Section 404 of the CWA provides for the protection of wetlands and waters of the U.S. from impacts associated with discharges of dredged or fill material. Discharges associated with the construction and maintenance of irrigation ditches is exempt from Section 404 permit requirements (33 CFR 323.4 (a), Exemption No. 3). Discharges associated with siphons, pump, headgates, wingwalls, weirs, diversion structures, and other facilities functionally related to irrigation ditches are included in this exemption. Therefore, no Section 404 permit is required for the Proposed Action. Because no permit for Section 404 of the CWA is required, water quality certification from the state under Section 401 is not required.

The existing weir is anticipated to collapse due to failure of the tieback system and undercutting on the downstream side of the structure if left unstabilized. The No Action alternative would result in the failure of the structure, creating a temporary pulse of sediment downstream. The Proposed Action alternative would temporarily increase turbidity due to earth-moving in the riverbed, but these temporary effects would be mitigated by the use of BMPs (see Section 2.2). The overall effect of the Proposed Action alternative would be to maintain water quality at its current level.

3.4 WETLANDS AND FLOODPLAINS

Wetlands are protected from development under EO 11990 (Protection of Wetlands). Guidance from the EO requires federally funded activities associated with wetlands to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural beneficial values of wetlands.

EO 11988 (Floodplain Management) provides federal guidance for activities within floodplains of inland and coastal waters. Preservation of the natural values of floodplains is of critical importance to the nation and the State of New Mexico. Federal agencies are required to "ensure that its planning programs and budget requests reflect consideration of flood hazards and floodplain management." No additional development of Pojoaque Creek is likely to result from this project. Flood hazard zones (100-year floodplains), as delineated by the Federal Emergency Management Agency, are not present in the project area. Neither of the alternatives would adversely affect wetlands or floodplains.

3.5 LAND USE

The Pueblo of Pojoaque manages the land immediately surrounding the acequia. The Pueblos of Nambe and Tesuque are located in the general vicinity of the acequia.

The acequia supplies irrigation water to 168 acres of private lands cultivated for livestock pasture, small vegetable gardens, fruit trees, and one vineyard for 78 landowners (NRCS 2000).

Under the No Action alternative, the weir would eventually collapse due to the combined effects of failure of the original tieback system, ongoing sedimentation on the upstream side, and undercutting on the downstream side. Total failure of the weir would reduce the efficiency of this system, and could result in changes of designation of the cropland from agricultural land uses to fallow or non-agricultural uses over time. Under the Proposed Action alternative, the improved design of the diversion would help to ensure the continued productivity of the irrigated land.

3.6 AIR QUALITY

The project area is in attainment with U.S. Environmental Protection Agency (USEPA) monitors ambient air quality standards, under the CAA. Two out the six criteria pollutants, carbon monoxide (CO) and particulate matters (PM_{10} and $PM_{2.5}$), are monitored in Santa Fe County by the State of New Mexico Environment Department (NMED) Air Quality Bureau because they are identified as problematic pollutants for this area (**Table 3-2**). None of these measured averages exceed the national standards. Increased dust and emissions from earthmoving and construction equipment would potentially contribute to temporary increases in criteria pollutants. However, through the use of BMPs, these effects would be mitigated. Neither alternative would produce significant impacts to air quality.

Table 3-2. Ambient Air Quality for the Monitoring Stations in Santa Fe County, New Mexico

Site Name	*Site Number*	*Pollutant Monitored*	*USEPA National Standard Maximum*	*2000 High Values Average*
Cerrillos Road	35-049-0019	CO	9 ppm (8-hour average)	1.67 ppm (8-hour average)
Runnels Building	35-049-0020	PM_{10}	150 $\mu g/m^3$ (24-hour average)	27.4 $\mu g/m^3$ (24-hour average)
Runnels Building	35-049-0020	$PM_{2.5}$	65 $\mu g/m^3$ (24-hour average)	8.94 $\mu g/m^3$ (24-hour average)
PERA Building	35-049-0001	PM_{10}	150 $\mu g/m^3$ (24-hour average)	19.7 $\mu g/m^3$ (24-hour average)

Source: Ball 2002.
Notes: ppm = parts per million.
$PM_{2.5}$ = particulate matter that measures 2.5 microns or less in diameter.
PM_{10} = particulate matter that measures 10 microns or less in diameter.
$\mu g/m^3$ = micrograms per cubic meter.

3.7 BIOLOGICAL RESOURCES

3.7.1 Terrestrial Communities

The project area is within the ecoregion characterized as Great Plains-Palouse Dry Steppe Province, Northern Rio Grande Basin Section by Bailey (1995) and the U.S. Forest Service. The native vegetative community characteristic of this ecoregion includes grama (*Bouteloua* spp.), galleta (*Hilaria jamesii*), dropseed grasses (*Sporobolus* spp.) and Great Basin big sagebrush (*Artemisia tridentata* var. *tridentata*). Vegetation community along the acequia is mostly characteristic of an urban environment with small crop fields. The construction site is directly in Pojoaque Creek with riparian vegetation along the riverbanks. The immediate construction site displays heavy human impacts.

Predominant vegetation found within the project area during a October 14, 2002, pedestrian field survey includes cottonwood species (*Populus* spp.), Chinese elm (*Ulmus pumila*), willow species (*Salix* spp.), Russian olive (*Elaeagnus angustifolia*), puncture vine (*Tribulus terrestris*), aster species (*Machaeranthera* spp.), cacti (*Opuntia* spp.), four-winged saltbush (*Atriplex canescens*), muhly (*Muhlenbergia* spp.) species, sedges (*Carex* spp.), and grama (*Bouteloua* spp.).

Common animals likely to occur in the proximity of the project area include, but are not limited to, coyotes (*Canis latrans*), woodrat (*Nestoma fuscipes*), deer mouse (*Peromysus maniculatus*), pocket gophers (*Thomomys* spp.), and short-horned lizards (*Phrynosoma dougLassii* var. *dougLassii*). Nuthatches (*Sitta* spp.), olive warblers (*Peucedramus taeniatus*), red-faced warblers (*Cardellina rubifrons*), hepatic tanagers (*Piranga flava*), and the mountain bluebird (*Sialia currucoides*) are avifauna likely to occur (Bailey 1995). During the pedestrian field survey, black-billed magpies (*Piranga ludoviciana*), American robins (*Turdus migratorius*), sparrow species (*Spizella* spp.), Steller's jay (*Cyanocitta stelleri)*, dark-eyed junco (*Junco hyemalis),* downy woodpecker (*Picoides pubescens),* nuthatch species *(Sitta* spp.), and a whiptail lizard (*Cnemidophorus* spp.) were observed.

The acequia rehabilitation would take place during the post-irrigation season, during the winter of 2002-2003. Construction would occur after terrestrial vertebrate breeding seasons and pose an insignificant threat to these communities. Construction work for the Acequia de Las Joyas would be limited to the existing weir structure. Disturbed ground outside the confines of the riverbed would be reseeded to native vegetation. Neither alternative would have a significant impact on the terrestrial flora and fauna.

3.7.2 Aquatic Communities

Pojoaque Creek, the source of water for the Acequia de Las Joyas system, is a marginal cold-water fishery/warm-water fishery (NMED 2000). Trout *(Onchorhynchus* spp.*)* species are present where habitat is suitable, but no stocking occurs. Aquatic invertebrates are also expected to occur in Pojoaque Creek as a food source for the trout. Pojoaque Creek receives the return water from the acequia via an arroyo approximately 3 miles downstream from the weir. Construction for the acequia would occur during the non-irrigation season; therefore, no water would be diverted to the acequia, minimizing stress to Pojoaque Creek aquatic communities. Neither alternative would significantly affect the aquatic communities of Pojoaque Creek.

3.8 THREATENED AND ENDANGERED SPECIES

Conservation of threatened and endangered flora and fauna are primarily managed by U.S. Fish and Wildlife Service (USFWS) under the ESA, the New Mexico Department of Game and Fish (NMDGF) under the Wildlife Conservation Act of 1974, and the New Mexico Energy, Minerals, and Natural Resources Department under the New Mexico Endangered Plant Species Act and Rule No. NMFRCD 91-1. Under the managing authorities, each agency maintains species lists for selected animals and plants deemed to be threatened and/or endangered. The threatened and endangered species of Santa Fe County, New Mexico are listed in **Table 3-3**.

Specialized habitat requirements such as vegetation type and cover, elevation, and geographic location for the species listed in Table 3-3 comprise the preferred habitat regimes for these flora and fauna (NMDGF 2001). Due to the lack of suitable habitat, these species are unlikely to occur in the project area. Therefore, these species would not be affected by the implementation of the Proposed Action or the No Action alternatives.

Table 3-3. Species Listed by the USFWS and the State of New Mexico as Threatened or Endangered in Santa Fe County, New Mexico

Species	*Federal Status*[1]	*State Status*[1]
Bald Eagle (*Haliaeetus leucocephalus*)	T	T
American Peregrine Falcon *(Falco pergrinus anatum*)	-	T
White-Tailed Ptarmigan (*Lagopus leucurus altipetens*)	-	E
Whooping Crane (*Grus americana*)	E	E
Mexican Spotted Owl (*Strix occidentalis lucida*)	T	-
Boreal Owl (*Aegolius funereus*)	-	T
Southwestern Willow Flycatcher (*Empidonax traillii extinus*)	E	E
Gray Vireo (*Vireo vicinios*)	-	T
Baird's Sparrow (*Ammodramus bairdii*)	-	T
American Marten (*Martes americana origenes*)	-	T
Black-Footed Ferret (*Mustela nigripes*)	E	E
Liljeborg's Peaclam (*Pisidium liljeborgi*)	-	T
Santa Fe Cholla (*Opuntia viridiflora*)	-	E

Source: NMRPTC 1999, NMDGF 2002.

Notes: (1) E = Endangered, T = Threatened.

3.9 CULTURAL RESOURCES

3.9.1 Culture History

Acequia de Las Joyas is situated in what archaeologists have defined as the upper Rio Grande region (Stuart and Gauthier 1988). Extending from Albuquerque northward to the Colorado state line, and from Abiquiu on the west to Taos on the east, this region is distinguished primarily by an absence of intensive occupations prior to ca. A.D. 1100. There is a notable absence of sites dating between ca. 4000 B.C. and A.D. 600 (Stuart and Gauthier 1988).

Of the Basketmaker (BM) III-Pueblo (P) II sites that are known from the region, many are situated adjacent to rivers. Although the recovery of the evidence of domesticated crops (e.g., corn) from selected sites in the area suggests at least some reliance on agriculture, the presence of relatively ephemeral structures suggests that hunting and gathering continued to be important throughout these periods.

The later prehistoric PIII period (A.D. 1175-1325) signals the emergence of permanent, though small, villages containing only eight rooms (Stuart and Gauthier 1988). The relatively sudden appearance of such villages in a region previously unoccupied coincides with the collapse of the Chacoan system to the west. Some scholars believe that the upper Rio Grande region became a recipient area for migrants from the west. Ceramics during this period consist primarily of Santa Fe Black-on-white varieties, followed by smaller proportions of Kwahee Black-on-white.

The subsequent PIV period (A.D. 1325-1540) is discriminated from the earlier cultural period by seeming increases in population aggregation into fewer, larger villages. Accompanied by the appearance of

Glaze E ceramics and Tewa Polychromes (e.g., Biscuit A and B, Sankawi B/C, and Wiyo Black-on-white), aggregated populations are inferred by the appearance of villages that routinely have 100 rooms, and some of which contain upwards of 500 rooms (Stuart and Gauthier 1988). Room size, however, is dramatically reduced from that observed during PIII times, suggesting that the overall amount of constructed room space may have been similar between PIII and PIV times. While there was not necessarily an increase in overall population, there was certainly a change in the manner in which these populations were organized.

It is during PIV times that the antecedents of today's modern puebloan cultures can be identified. In fact, Nambe and other nearby pueblos trace their ancestral sites to many of the PIV sites found in the region. The appearance of Spaniards in 1540 with the *entrada* of Coronado into New Mexico defines the beginning of the historic period (Winship 1904). Unlike other parts of New Mexico, there are direct accounts of irrigation among the puebloan peoples in the Pojoaque basin at the time of contact (Ellis 1970).

Following the founding of San Gabriel by Oñate in 1598 near San Juan Pueblo, Spanish settlement began to expand outwards into surrounding areas. It is not clear if this expansion included settlements along the Rio Pojoaque (Baxter 1997). This lack of information from the seventeenth century is due largely to the destruction of documents dating between 1598 and 1680 during the Pueblo Revolt of 1680. Between 1701 and 1705, lands near Pojoaque were conveyed to a number of Spanish settlers; land sales back and forth between Spaniards and Indians continued, often accompanied by the construction of acequias.

It is not certain when the Acequia de Las Joyas was constructed. In 1733, deed records indicate that Sandoval Martinez sold a parcel of land to Antonio Trujillo. According to descriptions appearing in the original Spanish documents, the northern edge of this parcel was bounded by an acequia identified by Baxter as the Acequia de Las Joyas (Baxter 1984). By the late 1770s, irrigation systems seem to have been well developed in the Pojoaque area.

Comparison of early twentieth century maps of the Acequia de Las Joyas with the current alignment indicates that this acequia exhibits relatively high locational stability, at least during the past 80 years and perhaps even longer. Although the weir has almost certainly been moved during successive rebuilding episodes, it has remained within the same quarter section as that identified during the early 1920s. As recently as 70 years ago, the overall character of agriculture along this acequia closely resembled seventeenth century descriptions.

At the same time, however, this acequia has been subject to centuries of annual maintenance. More recently, during the 1960s and 1970s, approximately 56 percent of the Acequia de Las Joyas has been altered from its earlier earthen-lined state to concrete lining.

In considering all available evidence, these narrative accounts spanning the period between 1733 and today indicate that the Acequia de Las Joyas has remained in continuous operation since early eighteenth century. Today, the acequia provides water to 78 irrigators and approximately 168 acres of cultivated land.

3.9.2 Methodology and Survey Results

The cultural resources survey of the proposed Acequia de Las Joyas rehabilitation was preceded by a check of site files at the New Mexico Cultural Resources Information System. A total of eight prehistoric and/or historic sites are found near the Acequia de Las Joyas.

The Class III inventory consisted of an intensive pedestrian survey of the construction and staging areas and the weir. Additional documentation of the acequia included walking the ditch and recording the locations of water control structures (e.g., culverts, check structures, taps), and identifying portions of the acequia that were or were not lined with concrete. Water was not flowing through much of the acequia at

the time of this inventory, so that detailed inspections of the sides, bottoms, and margins of the ditch were possible.

No prehistoric or historic archaeological sites were found within or immediately adjacent to the Acequia de Las Joyas or in the staging area proposed for temporary storage of materials during rehabilitation of the weir. Similarly, the existing intake and remainder of the acequia alignment do not contain any evidence of prehistoric or historic cultural resources.

The Acequia de Las Joyas is potentially eligible for inclusion on the NRHP under Criteria a and d of 36 CFR 60.4. The Proposed Action would have no adverse effect on the acequia's alignment, form, function, or eligibility as a potential historic property. The No Action alternative could affect the function of the acequia if the weir fails. Neither alternative would affect cultural resources in the area.

3.10 INDIAN TRUST ASSETS

Indian Trust Assets (ITA) are legal interests in property held in trust by the U.S. for Indian tribes or individuals. Examples of trust assets include land, minerals, hunting and fishing rights, and water rights. The U.S. has an Indian Trust Responsibility to protect and maintain rights reserved by or granted to Indian tribes or individuals by treaties, statutes, executive orders, and rights further interpreted by the courts. This trust responsibility requires that all federal agencies take all actions reasonably necessary to protect such trust assets.

The construction or implementation of the proposed project is not anticipated to affect any ITAs.

3.11 AESTHETICS

Construction would take place within the existing weir alignment; disturbed soil along the creek banks and staging area would be re-seeded according to the mixture stated in Section 2.2 (Environmental Protection). There would be no significant effect on aesthetic quality from the Proposed Action. If the weir fails and irrigation water becomes unavailable, land use changes could result that would negatively affect the character of the area.

3.12 NOISE

Current noise levels are typical for rural areas close to highways. Earthmoving equipment and trucks generally put out decibel (dB) levels 15 to 30 units higher (LHH 2001) than the prescribed Federal Highway Administration (FHWA) recommended levels for residential areas close to highways. Recommended levels of 67 dB are measured in L_{eq}, the constant average sound level, which contains the same amount of sound energy as the varying levels of the traffic noise (FHWA 1999). During the acequia rehabilitation, construction noise levels would be temporarily elevated. Neither alternative would significantly affect noise levels.

3.13 SOCIOECONOMICS

The project is located near the Pojoaque Census Designated Place (CDP), in Santa Fe County, New Mexico. A CDP is defined as "closely settled, named, unincorporated communities that generally contain a mixture of residential, commercial, and retail areas similar to those found in incorporated places of similar sizes (U.S. Census Bureau 2001a)." In the year 2000, Pojoaque had a population of 1,261, up from 1,037 in 1990, an increase of 22 percent (U.S. Census Bureau 1990, 2001a). Population statistics for Pojoaque CDP are identified and compared to the county, state, and national levels in **Table 3-4**. The state capitol, Santa Fe, is located in Santa Fe County. With 48 percent of the county population, it is the only major urban center in the county. Statistics at the county level are assumed to reflect the urban concentration of people, and would not reflect the rural nature of the site location.

Table 3-4. Profile of Ethnic and Racial Demographic Characteristics, Year 2000

Geographic Area	*Total Population*	*Race*								*Hispanic or Latino (of Any Race)*
		One Race							*Two or More Races*	
		Total	*White*	*Black or African American*	*American Indian and Alaska Native*	*Asian*	*Native Hawaiian and Other Pacific Islander*	*Some Other Race*		
U.S.	281,421,906	274,595,678	211,460,626 (77%)	34,658,190 (13%)	2,475,956 (<1%)	10,242,998 (4%)	398,835 (<1%)	15,359,073 (6%)	6,826,228	35,305,818 (13%)
New Mexico	1,819,046	1,752,719	1,214,253 (69%)	34,343 (2%)	173,483 (10%)	19,255 (1%)	1,503 (<1%)	309,882 (18%)	66,327	765,386 (44%)
Santa Fe County	129,292	124,024	95,053 (77%)	826 (<1%)	3,982 (3%)	1,133 (<1%)	94 (<1%)	22,936 (18%)	5,268	63,405 (51%)
Pojoaque CDP	1,261	1,218	657 (54%)	7 (<1%)	219 (18%)	0	0	335 (28%)	43	784 (64%)

Sources: U.S. Census Bureau 2001b,c.

There are 78 property owners with a total of 168 acres that use the irrigation ditch for which improvements are proposed. Typically, growers locally trade their produce and may supplement their income or food supply from crops grown on their irrigated land. The No Action alternative might eventually lead to decreased irrigation and reduced crop productivity, thus potentially lessening these benefits to the local economy. The Proposed Action would maintain current levels, or slightly improved levels, of irrigation. Neither alternative would have significant effects on the socioeconomics of the area.

3.14 ENVIRONMENTAL JUSTICE

EO 12898, Environmental Justice, and EO 13045, Protection of Children, requires that federal proponents assess how impacts of a Proposed Action may disproportionately affect minority and low-income persons or children under 18 years of age. Minority populations include all persons identified by the U.S. Bureau of the Census to be either of Hispanic race, regardless of country of origin, or all persons not of Hispanic origin other than White (i.e., Black, American Indian, Eskimo or Aleut, Asian or Pacific Islander, or other national origins). Low-income populations include all persons living below the poverty level, identified as a household income for a family of three of less than $12,802 in 1997 (U.S. Census Bureau 1997).

As shown in Table 3-4, Pojoaque CDP has a much higher percentage of Hispanics or Latinos (64 percent), when compared to 51 percent for Santa Fe County, and 44 and 13 percent for the state and nation, respectively. American Indians also comprise a greater percentage of the local population. However, other minority groups are underrepresented at the local level. Also, according to the 2000 census, approximately 28.9 percent of the local population (365 persons) is under age 18. This is not inconsistent with other levels, although it is slightly higher. In New Mexico, 28 percent of the population is under age 18; in Santa Fe County, 24.1 percent; and in the U.S., 25.7 percent. No income or poverty statistics have been released for Pojoaque CDP. However, 1997 poverty estimates from the census for the county, state, and national level are shown in **Table 3-5**. It is possible to conservatively estimate that the poverty level would be within those ranges.

Table 3-5. Percent Below Poverty, 1997 Estimate

	Santa Fe County	*New Mexico*	*United States*
All Persons	11.9	19.3	13.3
Children	17.2	27.5	19.9

Source: U.S. Census Bureau 2001d,e.

The Proposed Action alternative is expected to have a minor beneficial impact on approximately 78 families. Assuming that these owners are comprised of a similar racial and ethnic mix as the community as a whole, this could provide a small positive effect for minorities. Any primary or supplemental income from trading would also be beneficial. The construction would not disrupt or displace any residential or commercial structures. The work has been reviewed for compliance with this order and it has been determined that neither the No Action nor the Proposed Action alternative would adversely affect the health or environment of minority or low-income populations.

3.15 CUMULATIVE EFFECTS OF THE PROJECT

No other foreseeable actions by federal, state, tribal, or local officials are known to be planned for the project area. The Proposed Action would involve reconstructing an already disturbed area. Therefore, the potential impacts due to the implementation of the Proposed Action would not significantly affect natural, cultural, or socioeconomic resources.

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4.0 CONCLUSIONS

The No Action alternative would not preserve the function of the acequia because the present weir could collapse if left unstabilized. This alternative would not meet the purpose and need of the project to reduce maintenance and maintain water delivery, nor would it preserve the cultural and historic values of this acequia to the region, as intended under Section 1113 of WRDA.

The Proposed Action is the preferred alternative and would be beneficial to the entire acequia and its users by stabilizing a water structure that is in danger of total failure. It has the potential to result in positive impacts by improving the reliability of water delivery to irrigators. This alternative satisfies the purpose and need for the project and the intent of Section 1113 of WRDA.

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5.0 LIST OF PREPARERS, CONSULTATION, AND COORDINATION

5.1 LIST OF PREPARERS

- Fritz Blake, Corps Program Manager for Acequia Rehabilitation Program
- Gay Lopez, Corps Project Manager for Acequia Rehabilitation Program
- Patricia Phillips, Corps EA Project Manager
- Gregory Everhart, Corps Archaeologist
- Robin Brandin, SAIC QA/QC
- Ellen Dietrich, SAIC Project Manager
- Neal Ackerly, Dos Rios Consultants, Inc., Archaeologist
- David Dean, SAIC Biologist
- Heather Gordon, SAIC Environmental Scientist

5.2 COORDINATION

Agencies and entities contacted formally or informally in preparation of this Final EA include:

- Acequia de Las Joyas, Edward Romero, mayordomo
- Natural Resources Conservation Service
- New Mexico Department of Energy, Minerals, and Natural Resources
- New Mexico Department of Game and Fish
- New Mexico Environment Department
- New Mexico Office of the State Engineer
- New Mexico State Historic Preservation Office
- Pueblo of Nambe
- Pueblo of Pojoaque
- Pueblo of San Ildefonso
- Pueblo of San Juan
- Pueblo of Santa Clara
- Pueblo of Tesuque
- U.S. Fish and Wildlife Service

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Appendix A
Agency Comments on
Draft Environmental Assessment

State of New Mexico
ENVIRONMENT DEPARTMENT
Office of the Secretary
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2855
Fax (505) 827-2836

GARY E. JOHNSON
GOVERNOR

JOHN D'ANTONIO, Jr.
SECRETARY

December 4, 2002

Ellen Dietrich
SAIC Project Manager
Science Application International Corp.
2109 Air Park Road SE
Albuquerque, NM 87106

Dear Ms. Dietrich:

RE: DRAFT ENVIRONMENTAL ASSESSMENT FOR REHABILITATION OF ACEQUIA DE LAS JOYAS, SANTA FE COUNTY

This transmits New Mexico Environment Department (NMED) staff comments concerning the above-referenced Draft Environmental Assessment (EA).

The proposed project on the Rehabilitation of the Acequia de las Joyas is exempt from 401 certification of the Department's Surface Water Quality Bureau (SWQB), 33 CFR 323.4 (a) Exemption No. 3.

Page 3-2, second paragraph, line 11 states that BMPs will be implemented to protect water quality and the riparian environment. The SWQB's Watershed Protection Section concurs on this voluntary initiative and action taken by the contractor and Las Joyas Acequia Association.

We appreciate the opportunity to comment on this project.

Sincerely,

Gedi Cibas, Ph.D.
Environmental Impact Review Coordinator

NMED File No. 1671ER

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

December 11, 2002

Cons. # 2-22-03-I-090

Ellen Dietrich, SAIC Project Manager
2109 Air Park Road SE
Albuquerque, New Mexico 87106

Dear Ms. Dietrich:

Thank you for the opportunity to review the Draft Finding of No Significant Impact and Draft Environmental Assessment (DEA) for the Rehabilitation of Acequia de Las Joyas, Santa Fe County, New Mexico. The proposed project is to stabilize the irrigation diversion weir in Pojoaque Creek. The project is located southeast of Espanola near New Mexico Highway 503 and the Pojoaque Pueblo.

In general, the DEA adequately addresses fish and wildlife resource concerns. Based upon our review of information provided, we concur with your determination that implementation of the preferred alternative will not adversely affect federally threatened and endangered species or their habitats. We recommend, however, that the conservation measures identified in the DEA be incorporated into the work plan.

To assist you in the listed species consultation process, we have enclosed a current list of federally-endangered, threatened, proposed, and candidate species, and species of concern that may be found in Santa Fe County, New Mexico. Additional information about these species is available on the Internet at <http://nmrareplants.unm.edu>, <http://nmnhp.unm.edu/bisonm/bisonm.cfm>, and <http://ifw2es.fws.gov/endangeredspecies>. Under the Endangered Species Act, as amended (Act), it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with us further. If your action area has suitable habitat for any of these species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts. Please keep in mind that the scope of federally listed species compliance also includes any interrelated or interdependent project activities (*e.g.*, equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects.

Candidates and species of concern have no legal protection under the Act and are included in this document for planning purposes only. We monitor the status of these species. If significant declines are detected, these species could potentially be listed as endangered or threatened. Therefore, actions that may contribute to their decline should be avoided. We recommend that candidates and species of concern be included in your surveys.

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure no net loss of wetlands function and value.

The Migratory Bird Treaty Act (MBTA) prohibits the taking of migratory birds, nests, and eggs, except as permitted by the U.S. Fish and Wildlife Service. To minimize the likelihood of adverse impacts to all birds protected under the MBTA, we recommend construction activities occur outside the general migratory bird nesting season of March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until nesting is complete.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. In future correspondence regarding this project, please refer to consultation # 2-22-03-I-090. If you have any questions about the information in this letter, please contact Dennis Coleman at the letterhead address or at (505) 346-2525 ext. 4716.

Sincerely,

Joy E. Nicholopoulos

Joy E. Nicholopolous
Field Supervisor

Enclosure

cc: (w/o enc)
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico
Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division, Santa Fe, New Mexico

FEDERAL ENDANGERED, THREATENED,
PROPOSED, AND CANDIDATE SPECIES
AND SPECIES OF CONCERN IN NEW MEXICO
Consultation Number 2-22-03-I-090
December 11, 2002

Santa Fe County

ENDANGERED
- Black-footed ferret (*Mustela nigripes*)**
- Southwestern willow flycatcher (*Empidonax traillii extimus*)
- Rio Grande silvery minnow (*Hybognathus amarus*)***

THREATENED
- Bald eagle (*Haliaeetus leucocephalus*)
- Mexican spotted owl (*Strix occidentalis lucida*)

PROPOSED THREATENED
- Mountain plover (*Charadrius montanus*)

CANDIDATE
- Yellow-billed cuckoo (*Coccyzus americanus*)

SPECIES OF CONCERN
- New Mexican meadow jumping mouse (*Zapus hudsonius luteus*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- American peregrine falcon (*Falco peregrinus anatum*)
- Arctic peregrine falcon (*Falco peregrinus tundrius*)
- Baird's sparrow (*Ammodramus bairdii*)
- Northern goshawk (*Accipiter gentilis*)
- Rio Grande sucker (*Catostomus plebeius*)
- Chiricahua dock (*Rumex orthoneurus*)
- Santa Fe cholla (*Opuntia viridiflora*)

Index

Endangered	=	Any species which is in danger of extinction throughout all or a significant portion of its range.
Threatened	=	Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
Candidate	=	Candidate Species (taxa for which the Service has sufficient information to propose that they be added to list of endangered and threatened species, but the listing action has been precluded by other higher priority listing activities).
Species of Concern	=	Taxa for which further biological research and field study are needed to resolve their conservation status OR are considered sensitive, rare, or declining on lists maintained by Natural Heritage Programs, State wildlife agencies, other Federal agencies, or professional/academic scientific societies. Species of Concern are included for planning purposes only.
*	=	Introduced population
**	=	Survey should be conducted if project involves impacts to prairie dog towns or complexes of 200-acres or more for the Gunnison's prairie dog (*Cynomys gunnisoni*) and/or 80-acres or more for any subspecies of Black-tailed prairie dog (*Cynomys ludovicianus*). A complex consists of two or more neighboring prairie dog towns within 4.3 miles (7 kilometers) of each other.
***	=	Extirpated in this county
†	=	May occur in this county from re-introductions in Colorado.

Appendix B
Consultation with State Historic Preservation Office

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

Reply to
Attention of:

December 31, 2002

Engineering and Construction Division
Environmental Resources Branch

Ms. Jan Biella
Acting State Historic Preservation Officer
New Mexico State Historic Preservation Bureau
228 East Palace Avenue, Room 320
Santa Fe, New Mexico 87501

066758

Rec'd back 1-27-2003
GDE

Dear Ms. Biella:

Pursuant to 36 CFR Part 800, the U.S. Army Corps of Engineers (Corps), Albuquerque District, is seeking your concurrence in our determination of "No Adverse Effect to Historic Properties" for the proposed rehabilitation of the diversion structure and a sluice on the Acequia de Las Joyas. The Corps, at the request of the New Mexico State Engineer and the Acequia de Las Joyas Commission, is planning the rehabilitation project under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 *et. seq.*), as amended. The project area is located within the Pueblo of Pojoaque Reservation where the acequia diverts water from Pojoaque Creek about 1.2 miles east of the U.S. Highway 84/285 - State Highway 503 intersection near Pojoaque, Santa Fe County, New Mexico.

The proposed project would rehabilitate the existing steel sheet-pile structure by providing additional sheet-pile anchors upstream of the existing structure, steel armoring on the existing concrete inlet box and sluice box, and by installing concrete-capped gabion baskets and rock rip-rap for downstream erosion control. The project utilizes a design prepared by the U.S. Department of Agriculture's Natural Resources Conservation Service. Construction will occur during the non-irrigating season and in the immediate vicinity of the existing structure with existing access from State Highway 503. The staging area will be located adjacent to the construction area.

The proposed project would not change the acequia's intended function, form, or alignment. On October 14, 2002, Dos Rios Consultants, Inc., conducted the cultural resources survey and prepared the enclosed report entitled, **Cultural Resources Survey Report for the Acequia de Las Joyas, Santa Fe County, New Mexico** (NMCRIS No. 80763). The survey covered 100 percent of the project area for a total of about one acre (0.4 hectares). While there are eight previously recorded archaeological sites reported to occur in the area, none would be affected by the project. No prehistoric or historic artifacts, cultural resource manifestations, archaeological sites, or historic properties were found during the survey or are known to occur in the immediate vicinity of the project area.

The Acequia de Las Joyas dates to 1733 and is potentially eligible for inclusion to the National Register of Historic Places under criterion *a* and *d* of 36 CFR 60.4. The acequia system's earthen ditches and structural components have been subject to years of maintenance and rebuilt numerous times. Approximately 56 percent of the acequia system has been modified by concrete lining in the 1960s and 1970s. The proposed project would not change the alignment, form, or intended function, those attributes of the acequia that contribute to the acequia's cultural and historic significance.

Based on the information provided in the enclosed report, the Corps is of the opinion that the proposed Las Joyas acequia rehabilitation project would have "No Adverse Effect to Historic Properties."

Pursuant to 36 C.F.R. 800.11, should previously unknown artifacts or cultural resource manifestations be encountered during construction, work would cease in the immediate vicinity of the resource. A determination of significance would then be made, and a mitigation plan would be formulated in consultation with the New Mexico State Historic Preservation Officer and with any of the following Pueblos that may have interest or concerns in the project area: Pueblo of Pojoaque, Pueblo of Nambe, Pueblo of Tesuque, Pueblo of San Ildefonso, Pueblo of Santa Clara, or the Pueblo of San Juan.

-3-

If you have any questions or require additional information, please contact Mr. Gregory Everhart, Archeologist, at (505) 342-3352 or Mr. John Schelberg, Archeologist, at (505) 342-3359.

Sincerely,

Champe Green, acting for

Julie A. Hall
Chief, Environmental Resources Branch

1/17/03
Date

I CONCUR Dwayne Duncan
for JAN BIELLA, ACTING
NEW MEXICO STATE HISTORIC
PRESERVATION OFFICER

-4-

Enclosures

Copy Furnished: (w/o enclosures)

Don Klima, Director
Advisory Council on Historic Preservation
Office of Planning and Review
12136 W. Bayaud Ave., #330
Lakewood, Colorado 80228-2115

Appendix C
Tribal Consultation Letters

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

Reply to
Attention of

Engineering and Construction Division
Environmental Resources Branch

Honorable Tom F. Talache, Jr.
Governor, Pueblo of Nambe
Route 1, Box 117-BB
Santa Fe, New Mexico 87501

Dear Governor Talache:

The U.S. Army Corps of Engineers (Corps), Albuquerque District, at the request of the New Mexico State Engineer and the Acequia de Las Joyas Commission, is planning the rehabilitation of the acequia's diversion structure under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 *et. seq.*), as amended. The project area is within the Pueblo of Pojoaque Reservation, on Pojoaque Creek west of the community of Nambe and south of State Highway 503.

The proposed project would rehabilitate the existing steel sheet-pile structure by providing additional sheet-pile anchors upstream of the existing structure, steel armoring on the existing concrete inlet box and sluice box, and by installing concrete-capped gabion baskets and rock rip-rap for downstream erosion control. The project utilizes a design prepared by the U.S. Department of Agriculture's Natural Resources Conservation Service. Construction will occur during the non-irrigating season and in the immediate vicinity of the existing structure with access from State Highway 503. The staging area will be located adjacent to the construction area.

The Corps is seeking early input for consideration during planning of the project. Your input will also be used in preparing an environmental assessment to comply with the National Environmental Policy Act. Therefore, please use this opportunity to identify any potential issues or areas of concern. Written comments, supporting information, data, and/or references should be submitted **no later than November 8, 2002.**

-2-

Please provide written comments regarding environmental concerns to Mr. Ernie Jahnke and comments regarding cultural resources to Mr. Gregory Everhart at the above address.

If you have any questions or require additional information, please contact Mr. Jahnke at (505) 342-3416 or Mr. Everhart at (505) 342-3352.

Sincerely,

FOR Dana R. Hurst
Lieutenant Colonel, EN
District Engineer

Enclosures

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

Reply to
Attention of:

Engineering and Construction Division
Environmental Resources Branch

Honorable Jacob Viarrial
Governor, Pueblo of Pojoaque
39 Camino del Rincon #1
Santa Fe, New Mexico 87501

Dear Governor Viarrial:

The U.S. Army Corps of Engineers (Corps), Albuquerque District, at the request of the New Mexico State Engineer and the Acequia de Las Joyas Commission, is planning the rehabilitation of the acequia's diversion structure under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 *et. seq.*), as amended. The project area is within the Pueblo of Pojoaque Reservation, on Pojoaque Creek west of the community of Nambe and south of State Highway 503.

The proposed project would rehabilitate the existing steel sheet-pile structure by providing additional sheet-pile anchors upstream of the existing structure, steel armoring on the existing concrete inlet box and sluice box, and by installing concrete-capped gabion baskets and rock rip-rap for downstream erosion control. The project utilizes a design prepared by the U.S. Department of Agriculture's Natural Resources Conservation Service. Construction will occur during the non-irrigating season and in the immediate vicinity of the existing structure with access from State Highway 503. The staging area will be located adjacent to the construction area.

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If you have any questions or require additional information, please contact Mr. Jahnke at (505) 342-3416 or Mr. Everhart at (505) 342-3352.

Sincerely,

FOR Dana R. Hurst
Lieutenant Colonel, EN
District Engineer

Enclosures

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

Reply to
Attention of:

Engineering and Construction Division
Environmental Resources Branch

Honorable John Gonzales
Governor, Pueblo of San Ildefonso
Route 5, Box 315-A
Santa Fe, New Mexico 87501

Dear Governor Gonzales:

The U.S. Army Corps of Engineers (Corps), Albuquerque District, at the request of the New Mexico State Engineer and the Acequia de Las Joyas Commission, is planning the rehabilitation of the acequia's diversion structure under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 *et. seq.*), as amended. The project area is within the Pueblo of Pojoaque Reservation, on Pojoaque Creek west of the community of Nambe and south of State Highway 503.

The proposed project would rehabilitate the existing steel sheet-pile structure by providing additional sheet-pile anchors upstream of the existing structure, steel armoring on the existing concrete inlet box and sluice box, and by installing concrete-capped gabion baskets and rock rip-rap for downstream erosion control. The project utilizes a design prepared by the U.S. Department of Agriculture's Natural Resources Conservation Service. Construction will occur during the non-irrigating season and in the immediate vicinity of the existing structure with access from State Highway 503. The staging area will be located adjacent to the construction area.

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If you have any questions or require additional information, please contact Mr. Jahnke at (505) 342-3416 or Mr. Everhart at (505) 342-3352.

Sincerely,

for Dana R. Hurst
Lieutenant Colonel, EN
District Engineer

Enclosures

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

Reply to
Attention of:

Engineering and Construction Division
Environmental Resources Branch

Honorable Wilfred Garcia
Governor, Pueblo of San Juan
Post Office Box 1099
San Juan Pueblo, New Mexico 87566

Dear Governor Garcia:

The U.S. Army Corps of Engineers (Corps), Albuquerque District, at the request of the New Mexico State Engineer and the Acequia de Las Joyas Commission, is planning the rehabilitation of the acequia's diversion structure under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 *et. seq.*), as amended. The project area is within the Pueblo of Pojoaque Reservation, on Pojoaque Creek west of the community of Nambe and south of State Highway 503.

The proposed project would rehabilitate the existing steel sheet-pile structure by providing additional sheet-pile anchors upstream of the existing structure, steel armoring on the existing concrete inlet box and sluice box, and by installing concrete-capped gabion baskets and rock rip-rap for downstream erosion control. The project utilizes a design prepared by the U.S. Department of Agriculture's Natural Resources Conservation Service. Construction will occur during the non-irrigating season and in the immediate vicinity of the existing structure with access from State Highway 503. The staging area will be located adjacent to the construction area.

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If you have any questions or require additional information, please contact Mr. Jahnke at (505) 342-3416 or Mr. Everhart at (505) 342-3352.

Sincerely,

FOR Dana R. Hurst
Lieutenant Colonel, EN
District Engineer

Enclosures

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

Reply to
Attention of:

Engineering and Construction Division
Environmental Resources Branch

Honorable Denny Gutierrez
Governor, Pueblo of Santa Clara
Post Office Box 580
Espanola, New Mexico 87532

Dear Governor Gutierrez:

The U.S. Army Corps of Engineers (Corps), Albuquerque District, at the request of the New Mexico State Engineer and the Acequia de Las Joyas Commission, is planning the rehabilitation of the acequia's diversion structure under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 *et. seq.*), as amended. The project area is within the Pueblo of Pojoaque Reservation, on Pojoaque Creek west of the community of Nambe and south of State Highway 503.

The proposed project would rehabilitate the existing steel sheet-pile structure by providing additional sheet-pile anchors upstream of the existing structure, steel armoring on the existing concrete inlet box and sluice box, and by installing concrete-capped gabion baskets and rock rip-rap for downstream erosion control. The project utilizes a design prepared by the U.S. Department of Agriculture's Natural Resources Conservation Service. Construction will occur during the non-irrigating season and in the immediate vicinity of the existing structure with access from State Highway 503. The staging area will be located adjacent to the construction area.

The Corps is seeking early input for consideration during planning of the project. Your input will also be used in preparing an environmental assessment to comply with the National Environmental Policy Act. Therefore, please use this opportunity to identify any potential issues or areas of concern. Written comments, supporting information, data, and/or references should be submitted **no later than November 8, 2002.**

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If you have any questions or require additional information, please contact Mr. Jahnke at (505) 342-3416 or Mr. Everhart at (505) 342-3352.

Sincerely,

FOR Dana R. Hurst
Lieutenant Colonel, EN
District Engineer

Enclosures

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

Reply to
Attention of:

Engineering and Construction Division
Environmental Resources Branch

Honorable Paul Suazo
Governor, Pueblo of Tesuque
Route 5, Box 360-T
Santa Fe, New Mexico 87501

Dear Governor Suazo:

The U.S. Army Corps of Engineers (Corps), Albuquerque District, at the request of the New Mexico State Engineer and the Acequia de Las Joyas Commission, is planning the rehabilitation of the acequia's diversion structure under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 *et. seq.*), as amended. The project area is within the Pueblo of Pojoaque Reservation, on Pojoaque Creek west of the community of Nambe and south of State Highway 503.

The proposed project would rehabilitate the existing steel sheet-pile structure by providing additional sheet-pile anchors upstream of the existing structure, steel armoring on the existing concrete inlet box and sluice box, and by installing concrete-capped gabion baskets and rock rip-rap for downstream erosion control. The project utilizes a design prepared by the U.S. Department of Agriculture's Natural Resources Conservation Service. Construction will occur during the non-irrigating season and in the immediate vicinity of the existing structure with access from State Highway 503. The staging area will be located adjacent to the construction area.

The Corps is seeking early input for consideration during planning of the project. Your input will also be used in preparing an environmental assessment to comply with the National Environmental Policy Act. Therefore, please use this opportunity to identify any potential issues or areas of concern. Written comments, supporting information, data, and/or references should be submitted **no later than November 8, 2002.**

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If you have any questions or require additional information, please contact Mr. Jahnke at (505) 342-3416 or Mr. Everhart at (505) 342-3352.

Sincerely,

for Dana R. Hurst
Lieutenant Colonel, EN
District Engineer

Enclosures

Appendix D
Cultural Resources Survey Report

CULTURAL RESOURCES SURVEY REPORT FOR THE ACEQUIA DE LAS JOYAS SANTA FE COUNTY, NEW MEXICO

By
Neal W. Ackerly, Ph.D.

Prepared by
Dos Rios Consultants, Inc.
P.O. Box 1247
Silver City, NM 88062

under subcontract to

Science Applications International Corporation

for the
U.S. Army Corps of Engineers, Albuquerque District,
as part of the Acequia Rehabilitation Program

DACA47-97-D-0009
Delivery Order 14

February 2003

New Mexico Cultural Resources Information System No. 80763

1.0 ABSTRACT

On October 14, 2002, an archaeologist from Dos Rios Consultants, Inc., subcontractor to SAIC under contract to the U.S. Army Corps of Engineers, Albuquerque District (Corps), conducted a cultural resources inventory survey of the proposed construction area for the rehabilitation of the Acequia de Las Joyas near Pojoaque Pueblo in Santa Fe County, New Mexico. On-site inspection of the proposed staging area, and the complete alignment of the acequia, consisted of 100 percent coverage using 15-meter transects on approximately one acre. Recording activities conformed to all State of New Mexico and federal recording standards. The survey was conducted in anticipation of construction activities that include the rehabilitation of the acequia's weir and sluiceways. Included in the survey was the staging area and the weir alignment.

No prehistoric or historic archaeological sites were found or are known to occur within or immediately adjacent to this acequia. Eight recorded sites are located in the vicinity of the proposed construction work, but none would be affected by the project. The Acequia de Las Joyas is potentially eligible for inclusion on the National Register of Historic Places (NRHP) under Criteria a and d of 36 Code of Federal Regulations (CFR) 60.4. The proposed rehabilitation would have no effect on the alignment, form, or function of the acequia system. It is recommended, based on the proposed work and the findings of this cultural resources survey, that a clearance be provided for this proposed rehabilitation project. There would be "No Adverse Effect to Historic Properties" by the proposed rehabilitation project.

2.0 INTRODUCTION

The Corps, in cooperation with the New Mexico Office of the State Engineer (OSE) and the Acequia de Las Joyas Association, is planning a project that would rehabilitate the acequia system's weir and sluices. Work would be conducted under the Water Resources Development Act of 1986 (P.L. 99-662), which authorized the Corps to conduct the restoration and rehabilitation of irrigation ditch systems and acequias in New Mexico. Under Section 1113 of the Act, Congress found that New Mexico's acequias date from the eighteenth century and, due to their significance in the settlement and development of the western United States (U.S.), should be restored and preserved for their cultural and historic value to the region. The Secretary of the Army has been authorized and directed to undertake, without regard to economic analysis, such measures as are necessary to protect and restore New Mexico's acequias. The proposed improvements to this acequia satisfy the intent and purpose of this legislation.

3.0 LOCATION AND PROJECT DESCRIPTION

The Acequia de Las Joyas is located in Santa Fe County, New Mexico, surrounded by Pojoaque Pueblo grant lands **(Figure 1)**. The acequia obtains water from Pojoaque Creek. The system as a whole provides water to 78 irrigators and approximately 168 acres of cultivated land (OSE 1987:115). Although farm size averages 2.2 acres for the system as a whole, farms vary between 0.1 and 16.5 acres in size (OSE 1987:115). Annual acequia cleaning usually occurs in March. Water is distributed among *parciantes* on an 18-day rotation. The usual amount of time allotted for watering is about 2 hours per acre.

According to Mr. David Romero, the mayordomo for the Acequia de Las Joyas, the existing weir was constructed in the early 1970s, replacing an even earlier diversion structure (Romero 2002). Based on vintage accounts, this was likely a brush-and-rock weir. Accordingly, the weir for the Acequia de Las Joyas has already been modified. In addition, approximately 1.6 miles of the Acequia de Las Joyas was concrete-lined in the 1970s (Romero 2002). The concrete-lined portion of the acequia represents approximately 56 percent of the overall acequia length.

The weir proposed for rehabilitation is located about 1.2 miles east of the U.S. 84/285-State Route (SR) 503 junction **(Figure 2)**. The acequia alignment extends west-northwest from the weir approximately 2.9 miles, terminating west of SR 84/285.

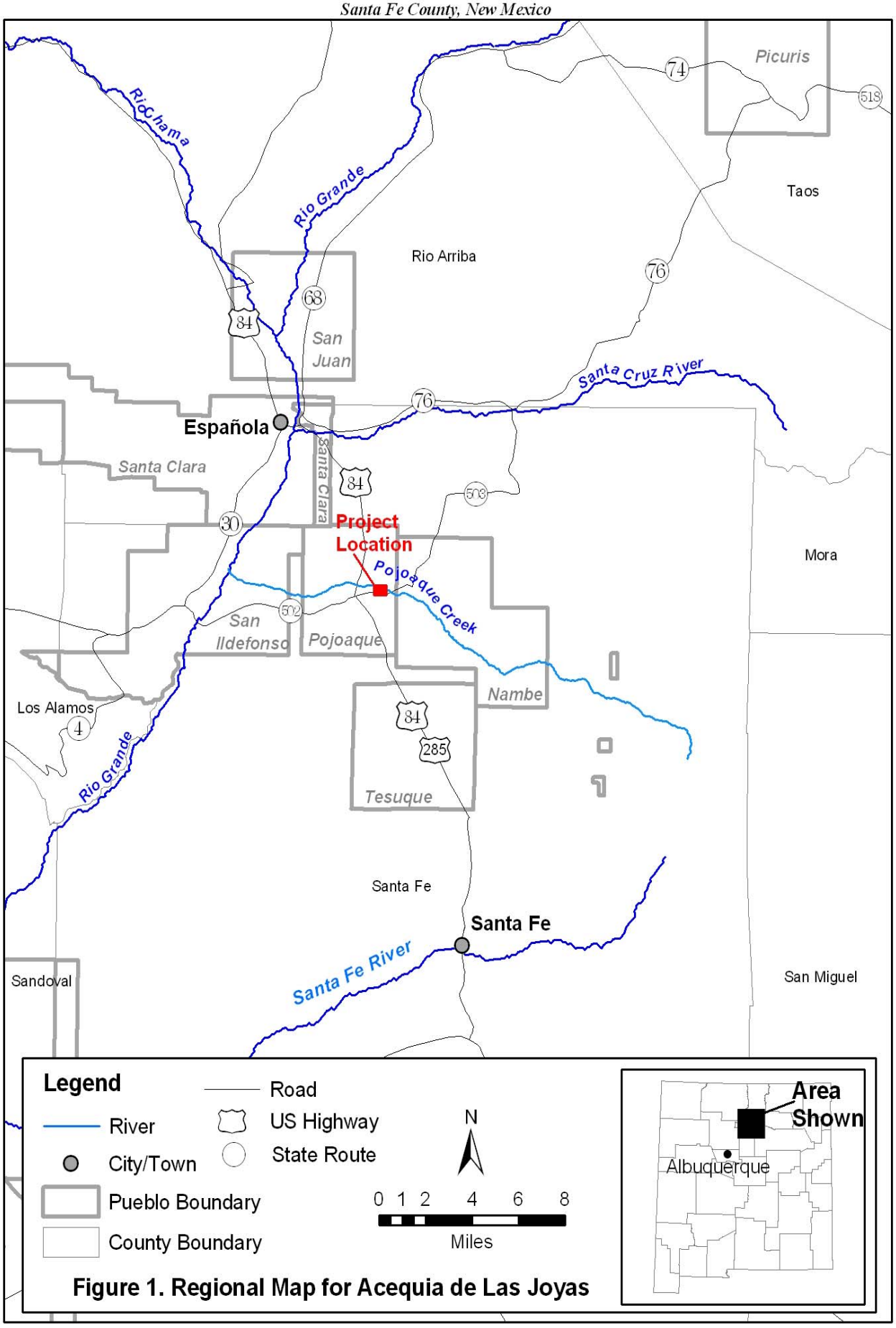

Figure 1. Regional Map for Acequia de Las Joyas

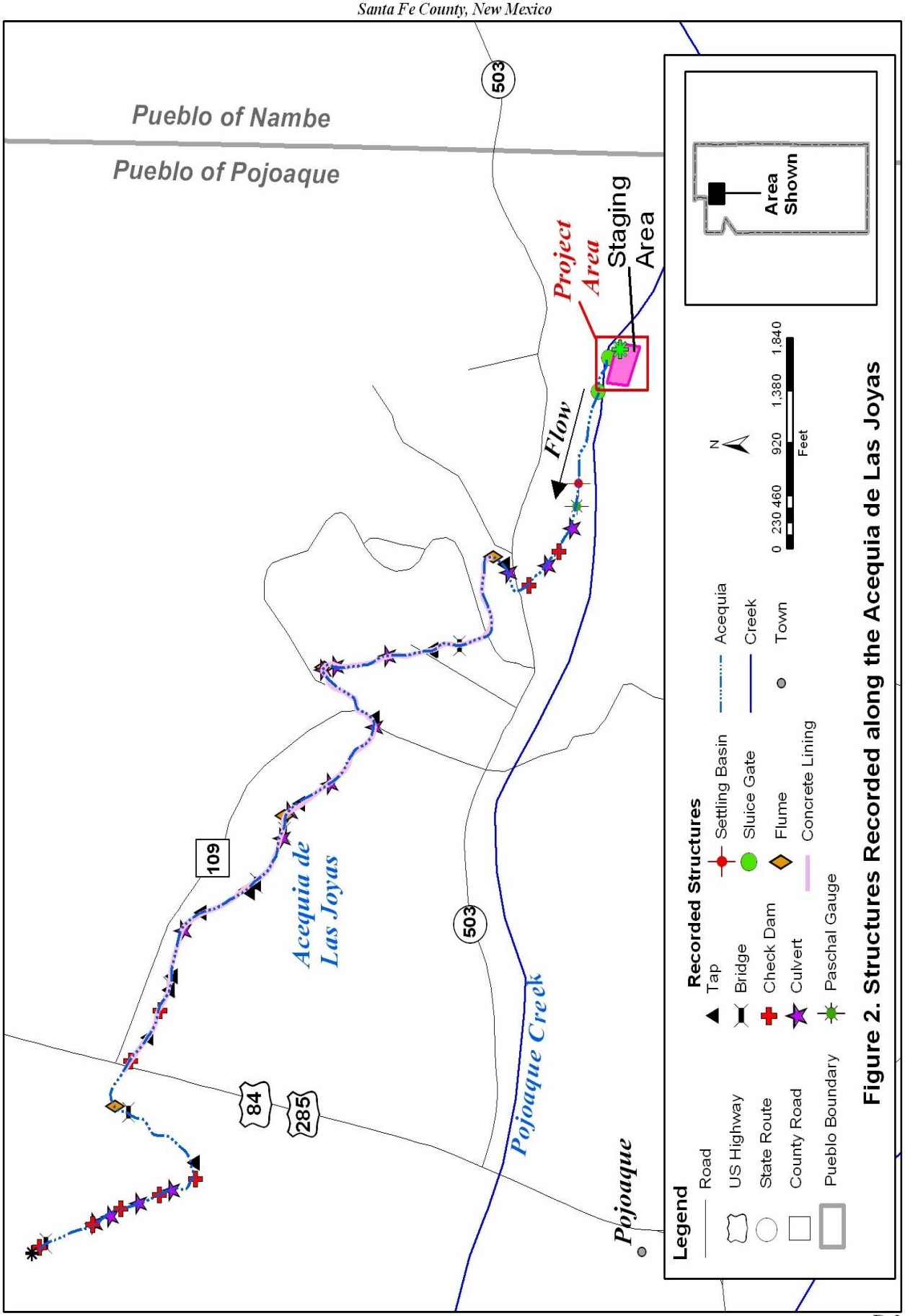

Figure 2. Structures Recorded along the Acequia de Las Joyas

To accomplish this proposed rehabilitation, a staging area of approximately one acre would be required. This staging area is located along the south side of Pojoaque Creek, adjacent to the south edge of the existing weir, and is located on Pojoaque Pueblo land **(Photograph 1)**. An existing access road that runs through the pueblo would be used. Pojoaque Pueblo has already agreed to grant a 1-year construction permit.

Proposed rehabilitation activities at the Acequia de Las Joyas are limited to: (1) straightening and anchoring the vertical steel sheet pile weir, and (2) placing rock-filled gabions immediately downstream of the weir, to form an apron that would minimize future erosion and undercutting of the weir structure. The area immediately upstream and downstream of the existing steel weir would be subject to modifications as part of the proposed rehabilitation effort **(Photograph 2)**.

4.0 CULTURE HISTORY

The Acequia de Las Joyas project area is situated in what archaeologists have defined as the Upper Rio Grande region (Stuart and Gauthier 1988:44). Extending from Albuquerque northward to the Colorado line, and from Abiquiu on the west to Taos on the east, this region is distinguished primarily by an absence of intensive occupations prior to ca. A.D. 1100. There is a notable absence of sites dating between ca. 4000 B.C. and A.D. 600 (Stuart and Gauthier 1988:47).

Of the Basketmaker III-Pueblo (P) II sites that are known from the region, many are situated adjacent to rivers. Although the recovery of evidence of domesticated crops (e.g., corn) from selected sites in the area suggests an emphasis on agriculture, the presence of relatively ephemeral structures (e.g., pithouses) suggests that hunting and gathering continued to be important throughout these periods.

The later prehistoric PIII period (A.D. 1175 to 1325) signals the emergence of permanent villages containing only eight rooms (Stuart and Gauthier 1988:52). The relatively sudden appearance of such villages in a region previously unoccupied coincides with the collapse of the Chacoan system to the west. Some scholars believe that the Upper Rio Grande became a recipient area for migrants from the west. Ceramics during this period consist primarily of Santa Fe Black-on-white varieties, followed by smaller proportions of Kwahee Black-on-white.

The subsequent PIV period (A.D. 1325 to 1540) is discriminated from earlier cultural periods by seeming increases in population aggregation into fewer, larger villages. Accompanied by the appearance of Glaze E ceramics and Tewa Polychromes (e.g., Biscuit A and B, Sankawi B/C, and Wiyo Black-on-white), aggregated populations are inferred by the appearance of villages that routinely have 100 rooms and some of which contain upwards of 500 rooms (Stuart and Gauthier 1988:52-53). Room size is dramatically reduced from that observed during PIII times, suggesting that the overall amount of constructed room space may have been similar between PIII and PIV times. While there was not necessarily an increase in overall population, there was a change in the manner in which these populations were organized.

It is during PIV times that the antecedents of today's modern puebloan cultures can be identified. Pojoaque, Nambe, San Juan, and other nearby pueblos trace their ancestral sites to many of the PIV sites found in the region.

The appearance of Spaniards in 1540, with the *entrada* of Coronado into New Mexico, defines the beginning of the historic period (Winship 1904). Unlike other parts of New Mexico, there are direct accounts of irrigation among the puebloan peoples in the Pojoaque basin at the time of contact. For example, Sosa's 1590 narrative indicates that irrigation was practiced at some unidentified pueblos—perhaps including Pojoaque—in the region (Hammond and Rey 1966:282):

> All six of these settlements had canals for irrigation, which would be incredible to anyone who had not seen them with his own eyes. The inhabitants harvest large quantities of corn, beans, and other vegetables.

Photograph 1. Staging Area South of Las Joyas Weir Looking East (2002)

Photograph 2. Las Joyas Weir Looking South (Note Bowed Section) (2002)

With the founding of San Gabriel by Onate in 1598 near San Juan Pueblo, Spanish settlement began to expand outwards into surrounding areas. It is not clear if this expansion included settlements along the Rio Pojoaque (Baxter 1997:5). This lack of information from the seventeenth century is due largely to the destruction of documents dating between 1598 and 1680 during the Pueblo Revolt of 1680.

The two decades following the Reconquest (1692) were chaotic throughout much of northern New Mexico. On the heels of the soon-quelled Revolt of 1696, Native American members of Nambe and Pojoaque temporarily abandoned their pueblos, perhaps fearing Spanish reprisals (Baxter 1984:14,23). During their seeming absence, some lands situated northwest of Nambe and near Pojoaque were granted to Spanish settlers (Baxter 1984:14,23), although it is not clear whether any actual settlement was initiated.

Between 1701 and 1705, lands near Pojoaque were conveyed to a number of Spanish settlers (Baxter 1984:14). Although Pojoaque Pueblo was reoccupied in 1707 by its former residents (Baxter 1997:7, 1984:14,23), land sales back and forth between Spaniards and Indians continued, often accompanied by the construction of acequias.

It is not certain when the Acequia de Las Joyas was constructed. In 1733, deed records indicate that Sandoval Martinez sold a parcel of land to Antonio Trujillo. According to descriptions appearing in the original Spanish documents, the northern edge of this parcel was bounded by an acequia identified by Baxter as the Acequia de Las Joyas (Baxter 1984:15).

By the late 1770s, irrigation systems seem to have been well developed in the Pojoaque area. Vintage 1776 descriptions by Domínguez of irrigation near Pojoaque amplify the character of irrigation in this area (Adams and Chavez 1956:59,63):

> They [Pojoaque] are really surrounded because of the nearness of the aforesaid Spanish settlement, whose lands encircle them above and below . . . Moreover, they are scanty, but they live off them. Their description is the same as that of those belonging to the Spanish settlement, for all grow grain . . . [Fields] are irrigated by ditches used by both Indians and settlers because they are in the same vicinity; and the harvest they yield is like that of the lands belonging to the [Spanish] citizens.

As this quotation makes clear, conditions and agricultural practices among the late eighteenth century Spanish settlers were similar to those of their Indian neighbors. What is perhaps more notable is the reliance in 1776 by Indians and Spaniards on the same irrigation system.

Later, in 1814, the Acequia de Las Joyas again appears as part of a boundary description associated with the sale of a parcel of land (Baxter 1984:18-19). In 1895, declarations filed by the *parciantes* of the Acequia de Las Joyas indicate that there were 40 irrigators relying on this acequia, although the quantity of irrigated acreage at the close of the nineteenth century is not specified.

According to Hodge, in 1926, the Acequia de Las Joyas had a capacity of 6.1 cubic feet per second and provided water to 271.8 acres of irrigated lands (Hodge 1938:227,230). Hodge's accompanying map showing the 1926 Acequia de Las Joyas alignment indicates that it conforms quite well to its current alignment, then as now, situated in the NW ¼ of Section 9, T19N, R9E. It is likely that the weir has been moved and rebuilt throughout its history.

By 1939, vintage documents indicate that the Acequia de Las Joyas was serving only 28 *parciantes* and provided water to only 110 acres (SCS 1939:27). Farm size at this time averaged between 3 and 4 acres (SCS 1939:27). The reason for the decrease in the number of irrigators, as well as the amount of acreage irrigated by the Acequia de Las Joyas between 1895 and 1939, is due to lands having been awarded by the Pueblo Lands Board to the residents of Pojoaque Pueblo in 1934 (SCS 1939:20,27).

According to descriptions from the mid-1930s, agricultural conditions among Spanish communities in the Pojoaque area were as follows (SCS 1939:23-24):

> Agriculture is the predominant occupation, and all the families depend on it for varying percentages of their total income. As elsewhere in this region, the subsistence crops are the most important. About one-third of the land is given over to wheat, which here also is of the Red Durham variety. The yield is fifteen to twenty bushels per acre. Next in importance is corn. The blue variety is highly prized, but it is not extensively planted nowadays because of the difficulty of grinding and processing for table use: i.e., the making of nixtamal flour for gruel. This gruel is also known as "atole," and was at one time generally served with the meal. Today, as one of the men remarked, it is coffee instead of atole. The most common variety of corn today, then, is the yellow, and this is used as feed for the stock. Some white corn is planted, and this is used for making a variety of hominy. The alfalfa fields (and this is the only nitrogenous crop in this part of the area), produce three cuttings during a good year, and this yields about two tons per acre. In the recent years of drouth, the stands have been badly damaged by drouth and prairie dogs. About the only fruit crop possible is apples, because of the frost, and even this is lost fifty percent of the time. Chili, cabbage, and onions are the cash crops. The land and climate are ideally suited for this type of agriculture, and with the increasing amount of canning done each year, these crops are becoming increasingly important even from the point of view of subsistence. The yield of chili is about one hundred to one hundred and fifty strings per acre, onions have yielded as high as six thousand pounds per acre, and the cabbages grow to a weight of twenty pounds or more. All garden truck does well here, and every family has its garden plot.

Similar 1930s descriptions of other Spanish villages situated along Pojoaque Creek confirm this general characterization of the region at this time (SCS 1939:23-24).

In considering all available evidence, these narrative accounts spanning the period between 1733 and today indicate that the Acequia de Las Joyas has remained in continuous operation since the early eighteenth century.

5.0 METHODOLOGY AND SURVEY RESULTS

5.1 Methodology

The cultural resources survey of the proposed Acequia de Las Joyas rehabilitation was preceded by a check of site files of the New Mexico Cultural Resources Information System. A total of eight prehistoric and/or historic sites are found within 0.5 mile of the centerline of the Acequia de Las Joyas. These include LA39957, LA103919, LA127919, LA128476, LA128693, LA129076, LA130842, and LA130843.

Four of these sites are related to mid-late prehistoric activities in the project area. LA127919, LA129076, LA130842, and LA130843 contain artifacts consistent with Developmental-Coalition Period (A.D. 600 to 1150) occupations. These sites typically contain surface ceramics, chipped stone, fire-cracked rock indicative of roasting/hearth areas, and evidence of subsurface (i.e., pithouse) and surface (i.e., masonry) rooms.

Two sites are related to historic occupations. LA39957 and LA128693 both contain remains dating to historic times (ca. A.D. 1880 to 1912). One is associated with Native American activities, while the other is more closely identified with the activities of Hispanics and Anglos.

One site, LA103919, contains both prehistoric and historic components. The prehistoric component has been assigned to the Developmental Period (A.D. 600 to 1200), while the historic component has been assigned to the late historic period (A.D. 1880 to 1912).

Finally, LA128476 is one of the field laterals associated with the Acequia de Las Joyas and is clearly related to later historic occupations in the region.

The Class III inventory consisted of an intensive pedestrian survey of the construction and staging areas and the structures. Additional documentation of the acequia included walking the ditch and recording the locations of water control structures (e.g., culverts, check dams, taps), and identifying portions of the acequia that were or were not lined with concrete. It is estimated that 56 percent of the entire acequia has been modified by structures or concrete lining.

Recording methods conformed to State of New Mexico and federal recording standards. All of the proposed project area was examined using 15-meter transects for 100 percent coverage of the project components. Global Positioning System (GPS) points along the acequia alignment were collected for later map preparation, and photographs were taken of the staging area, weir, and other water control structures.

Table 1 summarizes coordinates for the centerline of the entire acequia. Water was not flowing through much of the acequia at the time of this inventory, so that detailed inspections of the sides, bottoms, and margins of the ditch were possible. Representative examples of water control structures are presented in **Photographs 3 to 10**.

Photograph 3. Intake and Downstream View of Las Joyas Weir (2002)

Table 1. Locations of Water Control Structures in Acequia de Las Joyas

UTM[1,2]		Structures	UTM[1,2]		Structures
Easting	Northing		Easting	Northing	
410061	3972430	Intake	408829	3973418	West Flume
410051	3972442	Sluice Gate	408784	3973419	Bridge
409961	3972473	Sluice Gate	408768	3973427	Culvert
409716	3972532	Settling Basin	408649	3973503	Bridge
409654	3972537	Old Paschal Gauge	408646	3973509	Tap
409595	3972555	Culvert	408631	3973533	Tap
409533	3972591	Check Dam	408570	3973673	Tap
409496	3972630	Culvert	408522	3973727	Culvert
409443	3972682	Check Dam	408399	3973760	Tap
409477	3972746	Culvert	408372	3973765	Bridge
409500	3972759	Tap	408362	3973768	Tap
409514	3972770	East Flume	408307	3973793	Check Dam
409520	3972791	West Flume	408235	3973833	Tap
409520	3972791	Beginning Concrete	408174	3973881	Check Dam
409283	3972892	Bridge	408137	3973907	End of Concrete
409271	3972975	Tap	408082	3973943	East Flume
409269	3972978	Tap	408053	3973929	West Flume
409255	3973110	Culvert	408036	3973889	Bridge
409228	3973268	Culvert	407903	3973693	Tap
409233	3973283	East Flume	407858	3973685	Check Dam
409225	3973298	West Flume	407829	3973761	Culvert
409218	3973305	Culvert	407815	3973795	Check Dam with Tap
409089	3973152	Tap	407794	3973860	Culvert
409065	3973150	Culvert	407779	3973910	Check Dam
408913	3973284	Culvert	407759	3973945	Culvert
408861	3973376	Tap	407741	3973993	Culvert
408839	3973406	Culvert	407737	3973996	Check Dam with Tap
408837	3973408	East Flume with Tap	407686	3974138	Bridge

Notes: (1) Coordinates in UTM, Zone 13, North American Datum 1927, collected by GPS.
(2) Locations are accurate within ±4 meters.

Photograph 4. Intake of Acequia de Las Joyas (2002)

Photograph 5. Gate (Center) and Wasteway (Left) of Acequia de Las Joyas (2002)

Photograph 6. Second Gate (Center) and Wasteway (Left) on Acequia de Las Joyas (2002)

Photograph 7. Sediment Settling Basin on Acequia de Las Joyas (2002)

Photograph 8. First of Three Full-Round Pipe Flumes on Acequia de Las Joyas (2002)

Photograph 9. Abandoned Old-Style Paschal Measuring Gauge (2002)

Photograph 10. Current New-Style Paschal Measuring Gauge (2002)

5.2 Survey Results

No prehistoric or historic archaeological sites were found within or immediately adjacent to the Acequia de Las Joyas or in the staging area proposed for temporary storage of materials during rehabilitation of the weir. Similarly, the existing intake and remainder of the acequia alignment does not contain any evidence of prehistoric or historic cultural resources.

6.0 CONCLUSIONS

The Acequia de Las Joyas is potentially eligible for inclusion on the NRHP under Criteria a and d of 36 CFR 60.4. The earliest reference to the Acequia de Las Joyas appears in Spanish Colonial documents dating back to 1733. While the acequia may have been built before this time, this reference confirms it was constructed no later than this time. Seventeenth century agriculture along this acequia focused on wheat, corn, and other subsistence crops upon which local Spanish populations depended.

Comparison of early twentieth century maps of the Acequia de Las Joyas with the current alignment indicates that this acequia exhibits relatively high locational stability, at least during the past 80 years and perhaps even longer. Although the weir has almost certainly been moved during successive rebuilding episodes, it has remained within the same quarter section as that identified during the early 1920s. As recently as 70 years ago, the overall character of agriculture along this acequia closely resembled seventeenth century descriptions.

At the same time, however, this acequia has been subject to centuries of annual maintenance. More recently, during the 1960s and 1970s, approximately 56 percent of the Acequia de Las Joyas has been altered from its earlier earthen-lined state to concrete lining.

Today, as for the past 269 years, the Acequia de Las Joyas continues to obtain water from Pojoaque Creek and continues to provide the basis for much of the region's economy. The acequia provides water to 78 irrigators and approximately 168 acres of cultivated land.

The proposed rehabilitation of the weir and sluices that provide water for the Acequia de Las Joyas would have no adverse effect on the acequia's eligibility as a potential historic property. It would have no adverse effect on the acequia's alignment, function, or form. The 56 percent of the acequia that has already been modified would not change.

Based on these findings, a clearance is recommended for this proposed rehabilitation project.

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